WHAT IS CLAIMED IS:

1. An apparatus for measuring surface topography of a surface comprising:

a linearly polarized light source that generates a light beam;

optics that focus the light beam on a surface to be measured such that a normally incident beam deflection is provided, the optics including polarization optics such that the incident beam has a first polarization and a reflected beam from the surface has a second polarization different from the first polarization; and

a position sensitive detector positioned to detect the reflected beam.

- 2. The apparatus of claim 1, wherein the optics include a half-wave plate that receives the light beam.
- 3. The apparatus of claim 2, wherein the optics further include a long working microscope objective positioned to receive the light beam as an input from the half-wave plate and output a converging light beam.
- 4. The apparatus of claim 3, wherein the optics further include a polarizing beam splitter positioned to receive as an input the output of the half-wave plate and produces as an output light beam with the first polarization.
- 5. The apparatus of claim 4, wherein the optics further include a quarter-wave plate positioned to receive as an input the light beam with the first polarization and output a beam in a direction normally incident to the surface, the reflected beam from the surface being reflected by the quarter-wave plate towards the position sensitive detector.
- 6. The apparatus of claim 5, wherein the first polarization is p-polarization and the second polarization is s-polarization.

- 7. The apparatus of claim 6, wherein the polarizing beam splitter includes a 45° reflective surface positioned to reflect the beam reflected from the surface in a direction perpendicular to the direction normally incident to the surface.
- 8. The apparatus of claim 3, wherein the long working microscope objective outputs the converging light beam in a direction perpendicular to a normally incident direction to the surface.
- 9. The apparatus of claim 8, wherein the optics further include a polarizing beam splitter having a 45° reflective surface positioned to reflect the converging light beam from the long working microscope objective towards the surface in a normally incident direction to the surface.
- 10. The apparatus of claim 9, wherein the optics further include a quarter-wave plate positioned to receive as an input the light beam with the first polarization from the polarizing beam splitter and output a beam that is normally incident of the surface, with a reflected beam from the surface having the second polarization and directed by the quarter-wave plate through the polarizing beam splitter in a direction normal to the surface towards the position sensitive detector.
- 11. A method of measuring the topography of a surface, comprising the steps of: directing a beam of light of a first polarization towards a surface to be measured, the beam of light being directed at the surface in a direction normally incident to the surface, with a reflected beam from the surface also being normally incident to the surface;

changing the polarization of the reflected beam to a second polarization different from the first polarization;

directing the reflected beam with the second polarization to a position sensitive detector; and

determining the topography from measurements taken at the position sensitive detector.

- 12. The method of claim 11, wherein the step of directing a beam of light includes generating a collimated beam of linearly polarized light and passing the collimated beam through a half-wave plate.
- 13. The method of claim 12, wherein the step of directing a beam of light further includes converting the collimated beam from the half-wave plate into a converging beam.
- 14. The method of claim 13, wherein the step of directing a beam of light includes transmitting the converging beam through a polarizing beam splitter in a direction normally incident to the surface.
- 15. The method of claim 14, wherein the step of changing the polarization includes passing the reflected beam through a quarter-wave plate that changes the polarization of the reflected beam to the second polarization from the first polarization.
- 16. The method of claim 15, wherein the step of directing the reflected beam includes reflecting the reflected beam perpendicularly at the polarizing beam splitter towards the position sensitive detector.
- 17. The method of claim 13, wherein the step of directing a beam of light includes directing the converging beam in a direction perpendicular to a normally incident direction to the surface towards a reflective surface of a polarizing beam splitter that reflects the converging beam towards the surface in a direction normally incident to the surface.

- 18. The method of claim 17, wherein the step of directing the reflected beam includes transmitting the reflected beam through the polarizing beam splitter in a normal direction to the surface towards the position sensitive detector.
- 19. An arrangement for measuring topography of an ultra-smooth surface, comprising:

a source of laser light; and

means for directing the laser light on the ultra-smooth surface and measuring the topography of the ultra-smooth surface.

20. The arrangement of claim 19, wherein the means includes an optical arrangement configured to direct the laser light in a normally incident direction to the ultrasmooth surface.